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Requirements Paper

JEDMICS/CADA Quality Assurance (QA) of Output from JEDMICS

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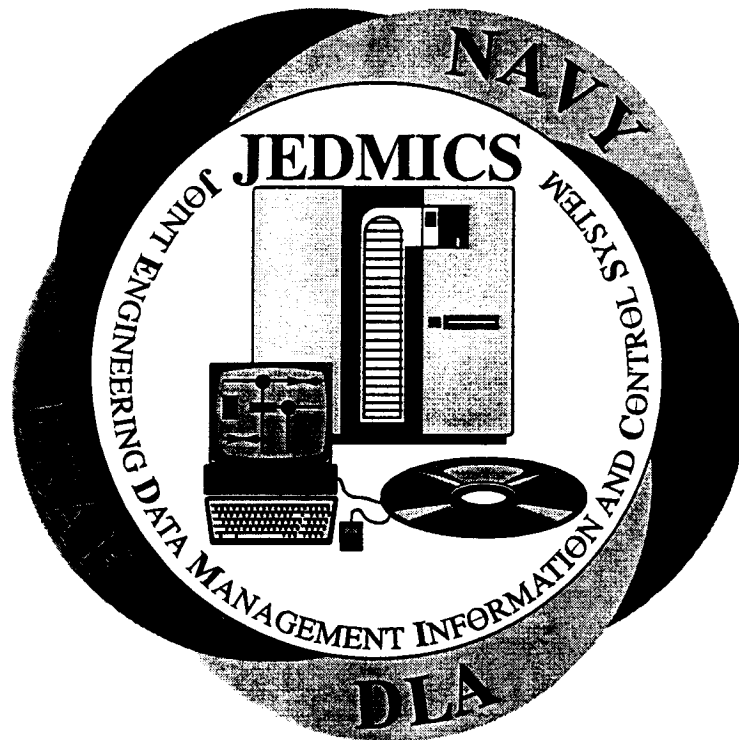
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***Joint Engineering Data Management Information
And Control System/
Computer-Assisted Data Acceptance
(JEDMICS/CADA)***

Requirments Paper

***JEDMICS/CADA Quality Assurance (QA) of
Output from JEDMICS***



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JEDMICS/CADA QUALITY ASSURANCE (QA) OF OUTPUT FROM JEDMICS

1. INTRODUCTION

The Joint Engineering Data Management Information Control Systems/Computer Assisted Data Acceptance (JEDMICS/CADA) system performs automated Quality Assurance (QA) on raster engineering drawings. This system operates in a non-intrusive manner with the host JEDMICS repository by using the JEDMICS Application Program Interface (API) to extract image files from either Permanent or Pending storage (referred to in this paper as Permanent and Pending, respectively).

The automated QA involves decisions relative to Image Quality, Image Validation, and Index Verification. After these decisions are completed, an evaluation status report, which contains the results of the evaluation, may be printed. This report can contain an entire set of images, or only those which were marked as "Rejects"¹ from that set. The report contains the JEDMICS index information necessary to query each image. This makes it possible for QA operators to select images on the report for viewing later at a JEDMICS workstation.

If the images had originated from Pending, the evaluated batch may be output as a new batch to Pending. In this case, the automated evaluation results would be mapped to the appropriate JEDMICS QA flags. The new batch can then be viewed on a JEDMICS workstation.

This paper will address using JEDMICS/CADA to perform automated QA of all output (bid sets and other) from JEDMICS.

2. JEDMICS/CADA CONFIGURATION

The functional configuration of the JEDMICS/CADA system is shown in Figure 1. The system can initiate a query to either JEDMICS Pending or Permanent via the JEDMICS Application Programming Interface (API) (version 2.5). As shown, read only access of Permanent is allowed, while read/write access can occur to Pending. The capabilities for automated image and index processing are shown, as well as operator visual QA, and output to a printer or upload of a new batch to Pending.

¹ A rejected image is one that has failed to pass at least one of the automated evaluation criteria.

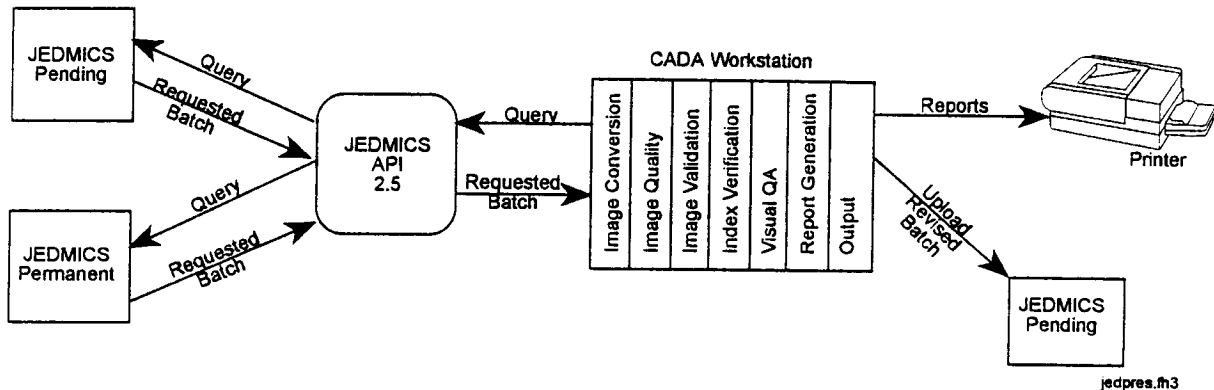


Figure 1. CADA/JEDMICS Functional Configuration

3. APPROACH

This paper investigates the feasibility and practicality of utilizing the JEDMICS/CADA System to provide automated QA of all output from JEDMICS. For purposes of this investigation the issues to be addressed are defined, and then the output of bid-sets is taken as an example for consideration.

3.1 Issues for Considerations

The following is the list of issues that were considered while investigating an approach.

- How can JEDMICS/CADA obtain the image files identified to be part of a JEDMICS output set?
- Is the image file directly accessible or does it need to be retrieved using a query through the API?
- What is the average size of an output set?

3.1.1 Access from the Output Server

The results of the discussions indicated that API access to the index and data files within the Generic output Server was not feasible. Some of the users did say that the index and data files of the output data are available within the Output Server and can be accessed via FTP. File addresses may vary from site to site. However, they could be made available to JEDMICS/CADA so that the index and data files that the JEDMICS system had already processed for output to a medium or via other means, could be FTP'd.

3.1.2 Data Set Access During Output Data Set Preparation

This alternative was proposed by some of the users that prepare bid-sets for output. Some users provide 100 percent visual QA of all image data prior to outputting as bid-sets. Others do QA sampling. It was suggested that QA be done at this stage, during building of the bid-sets because the Data Set Index file is available and JEDMICS/CADA could FTP the index information into JEDMICS/CADA. The index list of engineering would be used to build a query or queries in order to obtain from Permanent.

4. THE FEASIBILITY AND PRACTICALITY OF IMPLEMENTATION

4.1 Feasibility

Feasibility will be considered for the following:

- providing JEDMICS/CADA QA during the preparation stages of building the bid-set, or other output data sets, prior to uploading into the output server, and
- providing JEDMICS/CADA QA if access to the index and image files are available within the output server.

4.1.1 QA During Data Set Preparation

If the index information for each image of the data set is available, then it is possible to query Permanent and extract the image files for automated QA. It has been stated that this index information is available, but that it will require a manual FTP from JEDMICS/CADA. This capability does not presently exist (see Section 4.2.1).

4.1.2 QA From The Generic Output Server (GOS)

The next release of the JEDMICS API should provide access to index information for each image in an output set, at a minimum. The API may also provide access other image files on the GOS, but information received on this matter has been conflicting. If only the index is available, JEDMICS/CADA must parse this index information and generate queries to retrieve the image files from Permanent. If the image files are available from the GOS, the extra Step of Permanent access is eliminated.

4.2 Practicality

The practicality of implementing these approaches is discussed in Sections 4.2.1 and 4.2.2.

4.2.1 QA During Data Set Preparation

The objective of the users in recommending this approach was to eliminate the 100 percent QA of the output data sets by an operator. Since this is now performed during the bid-set, or other output building phase, it was reasonable to suggest using JEDMICS/CADA to perform this task. It can be done, however, the practicality is in question. The JEDMICS/CADA System presently does not have the capability to FTP index files into the system and use that index to generate a query to Permanent. This capability can be added to JEDMICS/CADA, however, it does introduce some concerns.

- The index files that have been analyzed suggest that to query Permanent, several queries (at worst case, one query per image file) will need to be generated against Permanent.
- Since this approach is intercepting the index file before it is passed to JEDMICS, the possibility exists that a problem may exist with the provided index information. It has been reported that on some systems this index file is keyed by hand.

This possibility demands that JEDMICS/CADA must perform basic field validation, and must keep track of and report query problems back to the operator. The availability of the output Data Set images within the Output Server appears to be a more practical approach.

4.2.2 QA From The Output Server

If the Bid-Set or Other Data Set Output images are available and can be downloaded into JEDMICS/CADA for processing, then this would be the most practical approach to take. The operators at each JEDMICS site could FTP the index and image data into JEDMICS/CADA and then initiate processing of the data files in the directory. An output report could be prepared for final operator acceptance prior to outputting the bid-set to the appropriate medium.

The present version of the JEDMICS API (version 2.5) does not allow access to the GOS. It has been stated that the next release will allow retrieval of the index information for each identified output set. PRC has also stated that the image files do not exist on the GOS and that the actions required for image retrieval, identified in Section 4.2.1, will be required.

Performing this approach does eliminate the need for the manual FTP that was identified in Section 4.2.1.

A practical problem with this approach is that the next release of the API may not allow the deletion of an output set from the GOS. If JEDMICS/CADA identifies problems with the quality of an output set, and the operator agrees, the operator will then need to remove that set from the GOS. This may not be able to be accomplished through the API.

5. CONCLUSIONS AND RECOMMENDATIONS

As stated, given both scenarios, it appears that it is feasible to implement JEDMICS/CADA output QA. The implementation issues have to do with the availability of the image file, and the ability to delete an output set from the GOS. As stated, JEDMICS/CADA can be modified to parse the index file and query Permanent for each image. However, this will cause load impacts on Permanent and require additional processing by JEDMICS/CADA.

The recommendation of this report is to examine the API for release 2.5.1 and for release 3.0. If neither of these releases allow retrieval of image files from the GOS, nor allow the deletion of an output set, then it is strongly recommended that these capabilities be added to the API. If these capabilities are not envisioned to be present within a short time frame, it is recommended that the approach identified in Section 4.2.1 be further investigated and prototyped.